

### **REMARKS/ARGUMENTS**

Applicant has carefully reviewed and considered the Final Office Action mailed on June 4, 2007, and the references cited therewith.

Claims 1-2, 7, 9, 11, 13, 15, 17-18, 37, 48, 50, 52, 54, and 56 are amended, claims 3-5, 19, and 57 are canceled, claims 21-36, and 45-47 are withdrawn, and no claims are added; as a result, claims 1-2, 6-18, and 20-56 are now pending in this application.

#### **§ 112 Rejection of the Claims**

Claims 1-20, 37-44 and 48-57 were rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant respectfully traverses the rejection as follows.

Applicant gratefully acknowledges that the Examiner will examine claims 1-20, 37-44, and 48-57 as presently recited. Applicant notes that “each x is independently a non-zero number” is recited in independent claims 1, 18, 37, and 48, as previously presented.

Applicant respectfully notes that the specification of the present application as originally presented supports, and clarifies, “each x is independently a non-zero number”. For example, the specification recites, “the subscripts are intended to denote the number of atoms of the metal cation selected from the defined group.” (Page 6, lines 19-20). Further, the specification goes on to recite, “each x can be independently a non-zero integer” and that “the value of “x” for each of the constituent elements may be different.” (Page 7, lines 23-25).

Hence, Applicant agrees with the Examiner’s statement in the Response to Arguments section of the present Final Office Action that the element “each x is independently a non-zero number” could be interpreted to mean that “each of the subscript values are determined independently, but still could be the same value”. Because “each x can be independently a non-zero integer”, each subscript x value can be

any non-zero integer. That is, each x value can be different from all other x values, the same as all other x values, or some x values can be the same as one or more other x values and the remaining x values can be different from the other x values.

Applicant also notes that amending formulae recitations in the claims to differ from the presently recited  $A_xB_xO_x$ ,  $A_xB_xC_xO_x$ ,  $A_xB_xC_xD_xO_x$ , and  $A_xB_xC_xD_xE_xO_x$ , as suggested by the Examiner (e.g.,  $A_uB_vO_w$ ,  $A_uB_vC_xO_w$ ,  $A_uB_vC_xD_yO_w$ , and  $A_uB_vC_xD_yE_zO_w$ ), is not supported in the recitation as originally presented. That is, when describing the compositions of the various metal oxide compounds, the specification always uses the subscript x “to denote the number of atoms of the metal cation selected from the defined group” with the clarification that “each x can be independently a non-zero integer” and that “the value of “x” for each of the constituent elements may be different.”

Applicant believes that using subscripts such as u, v, w, x, y, and z in the claims could be considered indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention, per the second paragraph of 112. However, Applicant respectfully submits that reciting the subscript x in the claims, after defining and explaining the composition of the compounds with the subscript x in the specification, will be appreciated by one of ordinary skill in the relevant art.

Moreover, Applicant notes that application number 10/799,811, which is in the same series of applications as the present application, both of which were filed by the same inventors on the same date, recites the same stoichiometric formulae as the present application and is pending appeal. Applicant submits that changing the recitation of one set of formulae used in the claims relative to a similar recitation used in a copending application could cause unnecessary confusion to readers of both, especially if the differing recitations appeared in two issued patents.

As such, Applicant respectfully submits that the intent of the element “each x is independently a non-zero number” will be appreciated by one of ordinary skill in the relevant art. Accordingly, Applicant respectfully requests reconsideration and

withdrawal of the 112 rejection of claims 1-20, 37-44, and 48-57, as currently amended. Claims 3-5, 19, and 57 have been canceled.

Claims 2, 5, 7, 9, 11, 13, 15, 17, 50, 52, 54 and 56 were rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant respectfully traverses the rejection as follows.

Applicant gratefully acknowledges that the Examiner examined claims 2, 5, 7, 9, 11, 13, 15, 17, 50, 52, 54, and 56 as originally recited. Applicant respectfully notes that the specification of the present application as originally presented supports, and clarifies, claim recitations such as, for example, “the formula  $A_xB_xO_x$  includes a ratio of A:B, wherein A, and B, are each in a range of about 0.05 to about 0.95”, as originally recited in dependent claim 2. For example, the specification recites on page 8, lines 1-5:

That is, the channel according to this embodiment can include various two-component oxide semiconductor films having atomic composition ratios with the relative concentration of each component falling within the range of about 0.05 to about 0.95.

The specification also recites, “the subscripts are intended to denote the number of atoms of the metal cation selected from the defined group.” (Page 6, lines 19-20). As such, Applicant respectfully submits that the intent of claim recitations such as, for example, “the formula  $A_xB_xO_x$  includes a ratio of A:B, wherein A, and B, are each in a range of about 0.05 to about 0.95”, as originally recited in dependent claim 2, will be appreciated by one of ordinary skill in the relevant art.

Nonetheless, in the interest of advancing prosecution, Applicant has endeavored to amend claims 2, 7, 9, 11, 13, 15, 17, 50, 52, 54, and 56 to further clarify the meaning thereof. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the 112 rejection of claims 2, 7, 9, 11, 13, 15, 17, 50, 52, 54, and 56. Claim 5 has been canceled.

§ 103 Rejection of the Claims

Claims 1, 2, 4, 5, 18, 20, 37 and 41-44 were rejected under 35 USC § 103(a) as being unpatentable over Hamada et al (JP Patent No. 405251705A) in view of Narushima et al. ("Electronic structure and transport properties in the transparent amorphous oxide semiconductor 2 CdOGeO", Phys Rev. B 66, 035203-1, 7/16/2002) with evidence provided by Chen et al (U. S. Publication No. 2005/0037237). Applicant respectfully traverses the rejection as follows.

Applicant's independent claim 1, as currently amended, presently recites:

a channel contacting the drain electrode and the source electrode, wherein the channel includes one or more compounds of the formula  $A_xB_xO_x$ , wherein the one or more compounds of the formula  $A_xB_xO_x$  includes one or more of gallium-germanium oxide, gallium-tin oxide, gallium-lead oxide, indium-germanium oxide, indium-lead oxide, each O is atomic oxygen, each x is independently a non-zero number, wherein the channel includes one of an amorphous form and a mixed-phase crystalline form;

Applicant's independent claim 18, as currently amended, presently recites:

means for controlling current flow electrically coupled to the drain electrode and the source electrode, wherein the means for controlling current flow includes one or more compounds of the formula  $A_xB_xO_x$ , wherein the one or more compounds of the formula  $A_xB_xO_x$  includes one or more of gallium-germanium oxide, gallium-tin oxide, gallium-lead oxide, indium-germanium oxide, indium-lead oxide, each x is independently a non-zero number, wherein the channel includes one of an amorphous form and a mixed-phase crystalline form;

In addition, Applicant's independent claim 37, as currently amended, presently recites:

providing a precursor composition including one or more precursor compounds that include  $A_x$  and one or more compounds that include  $B_x$ , wherein the one or more compounds of the formula  $A_xB_xO_x$  includes one or more of gallium-germanium oxide, gallium-tin oxide, gallium-lead oxide, indium-germanium oxide, indium-lead oxide, each x is independently a non-zero number, wherein the channel includes one of an amorphous form and a mixed-phase crystalline form;

From Applicant's review of the Hamada, Narushima, and Chen references, the references do not describe, teach, or suggest "the formula  $A_xB_xO_x$  includes one or more of gallium-germanium oxide, gallium-tin oxide, gallium-lead oxide, indium-germanium oxide, indium-lead oxide", "wherein the channel includes one of an amorphous form and a mixed-phase crystalline form", as recited in independent claims 1, 18, and 37, as currently amended.

As such, Applicant respectfully submits that each and every element and limitation of claims 1, 18, and 37, as currently amended, is not described, taught, or suggested in the Hamada, Narushima, and Chen references, either individually or in combination. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the 103 rejection of independent claims 1, 18, and 37, as currently amended, as well as those claims that depend therefrom. Claim 5 has been canceled.

Claims 6-9 and 38 were rejected under 35 USC § 103(a) as being unpatentable over Hamada et al (JP Patent No. 405251705A) in view of Narushima et al. ("Electronic structure and transport properties in the transparent amorphous oxide semiconductor 2 CdOGeO", Phys Rev. B 66, 035203-1, 7/16/2002) further in view of Phillips et al ("Transparent Conducting Thin Films of  $GaInO_3$ ", App. Phys. Let. Vol. 65 (1), July 1994) with evidence provided by Chen et al (U. S. Publication No. 2005/0037237). Applicant respectfully traverses the rejection as follows.

Claims 6-9 and 38 depend from independent claims 1 and 37, respectively. For the reasons provided above, Applicant submits that independent claims 1 and 37, as currently amended, are in condition for allowance.

From Applicant's review of the Phillips reference, the reference does not cure the deficiencies of the Hamada, Narushima, and Chen references. That is, the Phillips reference does not describe, teach, or suggest, "the formula  $A_xB_xO_x$  includes one or more of gallium-germanium oxide, gallium-tin oxide, gallium-lead oxide, indium-germanium oxide, indium-lead oxide", "wherein the channel includes one of an amorphous form and a mixed-phase crystalline form", as recited in independent claims

1 and 37, as currently amended. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the 103 rejection of dependent claims 6-9 and 38.

Claims 10-13 and 39 were rejected under 35 USC § 103(a) as being unpatentable over Hamada et al (JP Patent No. 405251705A) in view of Narushima et al. ("Electronic structure and transport properties in the transparent amorphous oxide semiconductor 2 CdOGeO", Phys Rev. B 66, 035203-1, 7/16/2002) further in view of Phillips et al ("Transparent Conducting Thin Films of GaInO<sub>3</sub>", App. Phys. Let. Vol. 65 (1), July 1994) further in view of Minami ("Transparent and Conductive Multicomponent Oxide films prepared by magnetron sputtering", Minami, J. Vac. Sci. Technol. A 17(4), Jul/Aug 1999) with evidence provided by Chen et al (U. S. Publication No. 2005/0037237).

Applicant respectfully traverses the rejection as follows.

Claims 10-13 and 39 depend from independent claims 1 and 37, respectively. For the reasons provided above, Applicant submits that independent claims 1 and 37, as currently amended, are in condition for allowance.

From Applicant's review of the Minami reference, the reference does not cure the deficiencies of the Hamada, Narushima, Phillips, and Chen references. That is, the Minami reference does not describe, teach, or suggest, "the formula  $A_xB_xO_x$  includes one or more of gallium-germanium oxide, gallium-tin oxide, gallium-lead oxide, indium-germanium oxide, indium-lead oxide", "wherein the channel includes one of an amorphous form and a mixed-phase crystalline form", as recited in independent claims 1 and 37, as currently amended. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the 103 rejection of dependent claims 10-13 and 39.

Claims 14-17 and 40 were rejected under 35 USC § 103(a) as being unpatentable over Hamada et al (JP Patent No. 405251705A) in view of Narushima et al. ("Electronic structure and transport properties in the transparent amorphous oxide semiconductor 2 CdOGeO", Phys Rev. B 66, 035203-1, 7/16/2002) further in view of Phillips et al ("Transparent Conducting Thin Films of GaInO<sub>3</sub>", App. Phys. Let. Vol. 65 (1), July

1994) further in view of Minami ("Transparent and Conductive Multicomponent Oxide films prepared by magnetron sputtering", Minami, J. Vac. Sci. Technol. A 17(4), Jul/Aug 1999) further in view of D ("Transparent Conducting PbO<sub>2</sub> films prepared by activated reactive evaporation", Phys. Rev. B 33, 2660-2664 (1986)) with evidence provided by Chen et al (U. S. Publication No. 2005/0037237). Applicant respectfully traverses the rejection as follows.

Claims 14-17 and 40 depend from independent claims 1 and 37, respectively. For the reasons provided above, Applicant submits that independent claims 1 and 37, as currently amended, are in condition for allowance.

From Applicant's review of the D reference, the reference does not cure the deficiencies of the Hamada, Narushima, Phillips, Minami, and Chen references. That is, the D reference does not describe, teach, or suggest, "the formula A<sub>x</sub>B<sub>x</sub>O<sub>x</sub> includes one or more of gallium-germanium oxide, gallium-tin oxide, gallium-lead oxide, indium-germanium oxide, indium-lead oxide", "wherein the channel includes one of an amorphous form and a mixed-phase crystalline form", as recited in independent claims 1 and 37, as currently amended. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the 103 rejection of dependent claims 14-17 and 40.

Claims 48-50 were rejected under 35 USC § 103(a) as being unpatentable over Akimoto (U.S. Patent No. 6,476,788) in view of Hamada et al (JP Patent No. 405251705A) in view of Narushima et al. ("Electronic structure and transport properties in the transparent amorphous oxide semiconductor 2 CdOGeO", Phys Rev. B 66, 035203-1, 7/16/2002) with evidence provided by Chen et al (U. S. Publication No. 2005/0037237). Applicant respectfully traverses the rejection as follows.

Applicant's independent claim 48, as amended, presently recites:

a channel contacting the drain electrode and the source electrode, wherein the channel includes one or more compounds of the formula A<sub>x</sub>B<sub>x</sub>O<sub>x</sub>, wherein the one or more compounds of the formula A<sub>x</sub>B<sub>x</sub>O<sub>x</sub> includes one or more of gallium-germanium oxide, gallium-tin oxide, gallium-lead oxide, indium-germanium oxide, indium-lead oxide, each O is atomic oxygen, each x is independently a non-zero number, wherein

the channel includes one of an amorphous form and a mixed-phase crystalline form;

From Applicant's review of the Akimoto, Hamada, Narushima, and Chen references, the references do not describe, teach, or suggest, either individually or in combination, "the formula  $A_xB_xO_x$  includes one or more of gallium-germanium oxide, gallium-tin oxide, gallium-lead oxide, indium-germanium oxide, indium-lead oxide", "wherein the channel includes one of an amorphous form and a mixed-phase crystalline form", as recited in independent claim 48, as currently amended. Accordingly, Applicant respectfully requests reconsideration and allowance of independent claim 48, as currently amended, as well as those claims that depend therefrom.

Claims 51 and 52 were rejected under 35 USC § 103(a) as being unpatentable over Akimoto (U.S. Patent No. 6,476,788) in view of Hamada et al (JP Patent No. 405251705A) in view of Narushima et al. ("Electronic structure and transport properties in the transparent amorphous oxide semiconductor 2 CdOGeO", Phys Rev. B 66, 035203-1, 7/16/2002) further in view of Phillips et al ("Transparent Conducting Thin Films of  $GaInO_3$ ", App. Phys. Let. Vol. 65 (1), July 1994) with evidence provided by Chen et al (U. S. Publication No. 2005/0037237). Applicant respectfully traverses the rejection as follows.

Claims 51-52 each depend from independent claim 48. For the reasons provided above, Applicant submits that independent claim 48, as currently amended, is in condition for allowance.

From Applicant's review of the Phillips reference, the reference does not cure the deficiencies of the Akimoto, Hamada, Narushima, and Chen references. That is, the Phillips reference does not describe, teach, or suggest, "the formula  $A_xB_xO_x$  includes one or more of gallium-germanium oxide, gallium-tin oxide, gallium-lead oxide, indium-germanium oxide, indium-lead oxide", "wherein the channel includes one of an amorphous form and a mixed-phase crystalline form", as recited in independent claim



48, as currently amended. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the 103 rejection of dependent claims 51-52.

Claims 53 and 54 were rejected under 35 USC § 103(a) as being unpatentable over Akimoto (U.S. Patent No. 6,476,788) in view of Hamada et al (JP Patent No. 405251705A) in view of Narushima et al. ("Electronic structure and transport properties in the transparent amorphous oxide semiconductor 2 CdOGeO", Phys Rev. B 66, 035203-1, 7/16/2002) further in view of Phillips et al ("Transparent Conducting Thin Films of  $\text{GaInO}_3$ ", App. Phys. Let. Vol. 65 (1), July 1994) further in view of Minami ("Transparent and Conductive Multicomponent Oxide films prepared by magnetron sputtering", Minami, J. Vac. Sci. Technol. A 17(4), Jul/Aug 1999) further in view of D ("Transparent Conducting  $\text{PbO}_2$  films prepared by activated reactive evaporation", Phys. Rev. B 33, 2660-2664 (1986)) with evidence provided by Chen et al (U. S. Publication No. 2005/0037237). Applicant respectfully traverses the rejection as follows.

Claims 53-54 each depend from independent claim 48. For the reasons provided above, Applicant submits that independent claim 48, as currently amended, is in condition for allowance.

From Applicant's review of the Minami reference, the reference does not cure the deficiencies of the Akimoto, Hamada, Narushima, Phillips, and Chen references. That is, the Minami reference does not describe, teach, or suggest, "the formula  $\text{A}_x\text{B}_x\text{O}_x$  includes one or more of gallium-germanium oxide, gallium-tin oxide, gallium-lead oxide, indium-germanium oxide, indium-lead oxide", "wherein the channel includes one of an amorphous form and a mixed-phase crystalline form", as recited in independent claim 48, as currently amended. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the 103 rejection of dependent claims 53-54.

Claims 55 and 56 were rejected under 35 USC § 103(a) as being unpatentable over Akimoto (U.S. Patent No. 6,476,788) in view of Hamada et al (JP Patent No. 405251705A) in view of Narushima et al. ("Electronic structure and transport properties

in the transparent amorphous oxide semiconductor 2 CdOGeO", Phys Rev. B 66, 035203-1, 7/16/2002) further in view of Phillips et al ("Transparent Conducting Thin Films of  $\text{GaInO}_3$ ", App. Phys. Let. Vol. 65 (1), July 1994) further in view of Minami ("Transparent and Conductive Multicomponent Oxide films prepared by magnetron sputtering", Minami, J. Vac. Sci. Technol. A 17(4), Jul/Aug 1999) further in view of D ("Transparent Conducting  $\text{PbO}_2$  films prepared by activated reactive evaporation", Phys. Rev. B 33, 2660-2664 (1986)) with evidence provided by Chen et al (U. S. Publication No. 2005/0037237). Applicant respectfully traverses the rejection as follows.

Claims 55-56 each depend from independent claim 48. For the reasons provided above, Applicant submits that independent claim 48, as currently amended, is in condition for allowance.

From Applicant's review of the D reference, the reference does not cure the deficiencies of the Akimoto, Hamada, Narushima, Phillips, Minami, and Chen references. That is, the D reference does not describe, teach, or suggest, "the formula  $\text{A}_x\text{B}_x\text{O}_x$  includes one or more of gallium-germanium oxide, gallium-tin oxide, gallium-lead oxide, indium-germanium oxide, indium-lead oxide", "wherein the channel includes one of an amorphous form and a mixed-phase crystalline form", as recited in independent claim 48, as currently amended. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the 103 rejection of dependent claims 55-56.

**CONCLUSION**

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney Timothy F. Myers at (541) 715-4197.

At any time during the pendency of this application, please charge any additional fees or credit overpayment to the Deposit Account No. 08-2025.

**CERTIFICATE UNDER 37 CFR §1.8:** The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: **MS AF** Commissioner for Patents, P.O. BOX 1450 Alexandria, VA 22313-1450, on this 27<sup>th</sup> day of July, 2007.

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